

Handle With Care , 11th September 2013

A workshop accompanying the installation *Microbial Familiars* by artist Hestia Peppe, part of *Nature Reserves* curated by Tom Jeffreys at GV Art Gallery, London.

“Kombucha is sugar-sweetened tea fermented by a community of organisms into a delicious sour tonic beverage, sometimes compared to sparkling apple cider. Kombucha is typically produced by a SCOBY, also known as a mother, that takes the form of a rubbery disk, which floats on the surface of the tea as it ferments. The community of organisms can also be transferred via the kombucha liquid itself, which can generate a new SCOBY.”

Sandor Katz, from *The Art of Fermentation*

“I think we learn to be worldly from grappling with, rather than generalizing from, the ordinary. I am a creature of the mud, not the sky. I am a biologist who has always found edification in the amazing abilities of slime to hold things in touch and to lubricate passages for living beings and their parts. I love the fact that human genomes can be found in only about 10 percent of all the cells that occupy the mundane space I call my body; the other 90 percent of the cells are filled with the genomes of bacteria, fungi, protists, and such, some of which play in a symphony necessary to my being alive at all, and some of which are hitching a ride and doing the rest of me, of us, no harm. I am vastly outnumbered by my tiny companions; better put, I become an adult human being in company with these tiny messmates. To be one is always to become with many. Some of these personal microscopic biota are dangerous to the me who is writing this sentence; they are held in check for now by the measures of the coordinated symphony of all the others, human cells and not, that make the conscious me possible. I love that when "I" die, all these benign and dangerous symbionts will take over and use whatever is left of "my" body, if only for a while, since "we" are necessary to one another in real time. As a little girl, I loved to inhabit miniature worlds brimming with even more tiny real and imagined entities. I loved the play of scales in time and space that children's toys and stories made patent for me. I did not know then that this love prepared me for meeting my companion species, who are my maker.”

Donna Haraway, from *When Species Meet*

Caring for Your SCOBY (Symbiotic Colony Of Bacteria and Yeast)

I have found it to be easy and rewarding to care for Kombucha. Though there is the potential for great detail and precision in Kombucha research I found myself following a process I have come to describe as the 'idiot control principle'; that is, I used almost no measuring, the most basic ingredients and that equipment which came to hand immediately. This meant that I was able to respond and make decisions intuitively and that I was forced to rely on my qualitative observations of the process. By allowing the possibility of discrepancy and failure one can start from the beginning and learn from mistakes. Even without using a prescribed method I have had a very low failure rate in the SCOBY's I have cared for.

Your SCOBY requires sugar, cold (hot tea would destroy the SCOBY and must be avoided at all costs) tea and a warm (room temperature and above) place, out of direct sunlight to grow. Suitable vessels are glass (ideal) or plastic containers with a wide, open neck for airflow. Metal vessels may corrode over time under acidic conditions and are not suitable. Traditionally no metal should come in contact with the SCOBY although stainless steel appears to have no adverse affects with short term contact.

To start a batch of Kombucha you will need a piece of SCOBY mat and some mature Kombucha tea in your chosen vessel. Add between four to nine parts cold sweet tea to the mature Kombucha tea. The larger the proportion of Kombucha tea to tea the quicker the fermentation will begin. Any tea including green tea, white tea or pu er tea will work but avoid smoked teas or those with oils in such as Earl Grey which may compromise the SCOBY. You have now inoculated your cold sweet tea with mature Kombucha SCOBY or 'mother'. Cover the vessel with fabric such as muslin, j-cloth or even a paper towel and secure with a rubber band. This will protect the SCOBY from dust and flies.

After around 5-8 days fermentation has begun to occur. The Kombucha will have perhaps begun to fizz, to smell vinegary and should have grown a new layer of SCOBY mat across the surface of the liquid. The degree to which any or all of these are the case will depend mainly on the ambient temperature, and the proportions of sugar, tea and SCOBY with which you began. Over this time acidity should have steadily increased. If you are impatient like me you may find using PH strips to test the acidity over this time keeps you well occupied. You will see the PH drop from around 4 to perhaps 2.5 over this period of fermentation. Tasting a little of the Kombucha with a straw is a good way of familiarizing yourself with the different stages. Different people prefer to drink the tea at different stages, it is sweeter and fizzier to start with and becomes progressively more sour and vinegar-like as time progresses.

It is generally considered that at about 15 days the tea is fully fermented although again this will depend on original proportions and conditions. After this the SCOBY is pretty much dormant until it is fed again. I would not recommend leaving your SCOBY out more than a month without feeding

although they can be kept airtight and dormant in a fridge indefinitely. Each feeding cycle produces a new mat and these can be used for new batches or given away to others or composted if you find you have too many. There are quite a few other applications for them about which more details can easily be found online including face-masks and dog chews!

The acidic nature of Kombucha limits the bacterial growth within it to the very specific parameters of the colony so the growth of most airborne contaminants such as moulds is unusual but does occasionally occur. If a batch goes mouldy throw it away and start again with a new mother. As well as Sandor Katz excellent guide in *The Art Of Fermentation* there are some excellent Kombucha troubleshooting guides online and a wealth of first hand experiences which I have found invaluable. Here are some places to start.

Cultures For Health:

<http://www.culturesforhealth.com/kombucha-troubleshooting-frequently-asked-questions-faq>

Kombucha, the Balancing Act:

http://users.bestweb.net/~om/kombucha_balance/

Other Reading:

Excerpt on Kombucha from *The Art of Fermentation*

<http://www.splendidtable.org/story/making-kombucha-an-excerpt-from-the-art-of-fermentation>

Sandor Ellix Katz's blog and online resource:

<http://www.wildfermentation.com/>

Self-taught chef and food hacker Josh Pollen's research blog:

<http://joshpollen.tumblr.com/>

Nordic Food Lab on their Kombucha research and from whose SCOBYs these mothers are descended:

<http://nordicfoodlab.org/blog/2013/2/komboooucha>

A fascinating article on how microbial research is reshaping science.

<http://www.smithsonianmag.com/science-nature/Microbes-The-Trillions-of-Creatures-Governing-Your-Health-204134001.html?c=y&page=2>

Donna Haraway speaking about genomic traces of interspecies relationships for New Scientist:

<http://www.youtube.com/watch?v=DqMW9-G2gCo>

More work by Hestia Peppe

www.peepsgame.net